

Homan (Geo.)

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PROGRESS OF EPIDEMICS.

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## ON THE RISE AND PROGRESS OF EPIDEMICS.

BY GEO. HOMAN, M. D., ST. LOUIS.



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WHEN the course of on-coming time shall have brought to the minds of men a knowledge of the forms and features, identities and belongings of the seeds of epidemic disease as fixed and definite as that now held regarding the seeds of animal and vegetable life, and to the attainment of which knowledge observation, analogy and experiment alike all promise and tend, doubtless in that fulness of time and attainment surprise will be expressed that a conviction and conclusion so reasonable and satisfying, and so fully in keeping with all the teachings of nature, should ever have been denied or seriously questioned. No doubt arises in the mind of an observer when viewing a recognized member of the animal or vegetable kingdom, however high or low its relative rank therein may be, that it had its beginning in a seed, cell or spore that was endowed with fertile properties by a progenitor; and, similarly, no reasonable doubt may exist that the wasting activity of developed infection is but the widen-

ing expression of forces or forms of life that may for a time lie dormant, and be then again in their season awakened.

Repeated observation and experience of the rise and fall, ebb and flow of diseases that have wide prevalence and power, long since led to the conviction in the minds of intelligent observers that their operations were no more exempt from the control of law than were other forces in nature whose workings and results are less alarming, and are manifested without inspiring the dread and panic that attends displays of pestilential power. This conviction, based upon observed and tested facts, that such exhibitions of destroying energy were dependent upon fixed and definite changes and evolutions in the forms and lives of specific seeds, or organisms, was logical, unavoidable, inexorable; and the process by which it was reached was the same in kind as that by which the astronomer foretold and located a planet, until then unknown, from otherwise unexplainable perturbations observed in the movements and behavior of other heavenly bodies; the circumstances justified no other conclusion, and the telescope, when properly pointed, made good the prophecy and calculation. The finding of the unknown planet was less a discovery than a demonstration of what was previously known must in the very nature of things exist, and the microscopical determination of certain entities, as causes of epidemical movements, was simply a triumphant confirmation of the just inferences of medical pre-science and rational observation and acumen, this result being as necessary as that there should be a cause for every consequence and a parent for every offspring.

The processes and progress of epidemic development have their likeness and parallel in the beginnings and unfoldings of vegetable, if not animal, life, the organic causes of such manifestations having their preferred soil, or medium, and times of growth and seeding, each differing after its kind, but distinct withal in type and relationship, and in fruitfulness limited only by inherent vitality, and the kindliness of soil and season and surroundings upon which they happen to fall. In the interval between sowing and ripening they are exposed to adverse as well as to favoring influences, and that planting, whose earlier appearance gave promise of an abundant harvest, may have its later growth

thwarted and blighted through mischance, or untoward environment, and no ripened yield, infective in potency and purpose, be had from the earlier promise. The parable of the sower and the seed may illustrate somewhat the inception and behavior of a general infection, as well as convey a lesson in homilites or husbandry:

"Behold a sower went forth to sow; and when he sowed, some seed fell by the wayside, and the fowls came and devoured them up: Some fell upon stony places, where they had not much earth; and when the sun was up, they were scorched; and because they had no root, they withered away. And some fell among thorns; and the thorns sprung up and choked them. But other fell into good ground, and brought forth fruit some an hundred-fold, some sixty-fold, some thirty-fold."

When the seeds of a certain infection, which has in itself the power of increase and self-multiplication, fall broadcast upon the human population-soil of a community, race or nation, the results that follow are determined by a number of conditions, the chief ones being, as before intimated, the fecundity or vital efficiency of the seed itself, the fitness of the soil upon which it is sown, the favorableness of the season, and the circumstances attending its deposit and retention in soil suited to its nurture and development. Warmth and moisture with abundant light and air are the recognized accessories of healthy growth in the higher forms of animal and vegetable life, but the prolific vigor of a population-infection is best attained where moist organic decay is found with decrease of light and a warm and stagnant atmosphere. This is an established fact as regards the active spreading diseases that are domiciled in, and affect temperate climates; and, moreover, is most eminently true of those having an alien habitancy. That the domestic scourges may be held in effectual check as regards the body of population, if it may not be quite possible to entirely eradicate them, cannot be denied. The soil from which they spring may be sterilized in various ways and degrees by unsparing scrutiny and cleanliness of earth, air and water; and their epidemic potency and infective vigor may be pauperized and weakened until their failing grasp shall include only here and there an individual, and no longer as before whole communities, races and peoples.

The typical spreading infections of to-day, which still exist in their primitive vigor, are of foreign birth and rearing; and of these, in pandemic purpose, dominion and power and disregard of geographical lines, cholera is the chiefest and most dreaded of man. Its onward march is in lines of latitude following the commercial pathways of man, while yellow fever is confined to limited longitudinal parallels, and its power fails and perishes in the presence of northern frosts.

Although it may be thought premature to attempt to declare all the ways and methods of cholera infection as it grows and ripens to epidemic fulness, it is yet certain that the mystery and dire confusion with which the terrified minds of men once surrounded this disease is gone forever, and that the story of its nature and epidemic rise and progress is one of comparative simplicity and clearness.

It possesses a fixed and certain entity as its leaven, or contagium, endowed with mobile and itinerant power and in its travels thrives best where cleanliness is least known and practised—such unwholesome conditions representing the good ground mentioned in the parable which yielded such abundant returns from the seed cast upon it; while those situations where purification and disinfection make barren a soil otherwise fitted for its reception and propagation, may stand for the places where the seed cast by the hand of the sower was destroyed, or failed to mature its perfected kind.

The genesis and evolution of a cholera epidemic in countries beyond its habitual range takes place somewhat as follows, account being taken of the material agencies mainly which tend to enlarge the area of morbid influence:

The importation of the poison having occurred by means of a person ill of the disease, or through clothing or other material charged with its viable seeds, and these being deposited in congenial soil, no effectual steps being taken to destroy both seeds and medium through ignorance, or a desire on the part of those affected to conceal the alarming truth, after a short period of germinative change a continually widening and radiating centre of active infection is created and maintained through the evacuations of the multiplying victims, the morbid interchange being,

apparently, not directly from person to person, but from person to medium and from medium to person again.

In the chain of evidence which science has forged from ascertained facts in the life history of the organisms which set in motion the train of phenomena and symptoms called cholera, only a single link remains unclosed, and that is concerning the precise shape, or transitional form, in which the principle of the disease is quiescent yet portable and least subject to unfavorable influences.

The ground necessary for the full development of the infection is the human intestine with alkaline contents; and when the invading germs have finally passed the barrier which a healthy stomach sets up against them by its acid secretion in which they are destroyed, they have reached their chosen field of action, and the changes wrought and symptoms that follow are due to their myriad generation and onslaught upon the vital forces through the enteric mucous tract. Their sojourn and multiplication in the lining of the bowel destroys its epithelial coating, and has the practical effect of a persistent irritant, of a continuing intestinal blister, an exhaustive and constant outflow of serum taking place which is most injurious in its effect upon the sufferer's vital powers. Whether or not, as some suppose, their presence in the bowel generates a certain poison that of itself shocks, depresses and kills, is of little practical moment.

It is a well ascertained fact, both by long extended observation and recent microscopical demonstration, that the active agent of cholera infection is speedily destroyed by acid exhalations in the air, or by liquids of similar reaction; and, although the question of the medical treatment of the disease is beside the purpose of this paper, it is of much interest to note how generally sound and intelligent were the views and deductions of empiricism, held by a majority of medical men for many years, and the practical value of the line of treatment followed by them, although its scientific rationale was unknown until microscopy gave the desired and long sought for clue.

In the light of recent investigations the established early practice of giving a mild purge to excite healthy action in the stomach and liver, followed by dilute mineral acids and prepa-

rations of opium to destroy the poison, and dull the sensibility of the system to the shock of the disease, with other accessory measures, is based on good etiological and pathological grounds; and the degree of success that attends any line of treatment will no doubt very greatly depend on the closeness with which the indications, as thus afforded, are understood and obeyed.

Success or failure in dealing with an intensifying infection, such as cholera, when under epidemic headway, depends so very greatly on the manner in which its individual cases are handled, and the care taken to instantly destroy the infection matter of the discharges and the filth medium of its reproduction, that the question as to whether the disease shall generally prevail in this country during this, or any other season, must be answered separately by every household, community and city in the land. That it will sooner or later pass our seaboard quarantine, howsoever strict for a time it may be, cannot in reason be doubted; access to the interior will then be easy, and in the unclean and unprepared places it will display its greatest activity, for certain it is that it attacks no body of people where the ground has not been made ready for its development and operations.

The history of the rise and progress of all epidemics fatal to mankind repeats the well-taught lesson that prevention is better than cure, and these teachings are being more and more heeded and obeyed, as the financial, not to say the moral or hygienic, instinct, in man sees clearly the immense disadvantage under which business interests labor in places that are not reasonably well fortified against pestilence, and where districts are exposed to repeated decimations by preventable disease. Moreover, the moral courage and steadiness of a people are strengthened and confirmed where cleanliness is both real and apparent, and such a population is less apt to stampede, when threatened with infection, and to have recourse to the doubtful expedient of flight, than one where an opposite condition prevails. That resolute courage should be maintained even amidst unfavorable surroundings is shown by the fact that fear disposes persons to attacks, especially of cholera, by suspending or disordering the healthy action of the stomach; and, besides, when dread and panic seize a population, everything save flight is forgotten; no precautions

are observed, existing foul conditions are increased many fold, and pestilence holds sway with increasing power until the field is exhausted, or changes in conditions of the weather bring it to an end, or the returning courage of the inhabitants enables them to arrest its course and spread.

The progress already made in epidemiology and that which inquisitive science now so surely promises, together with the results attained in preventive medicine, are due to the patient, unselfish labors of medical men; and these labors, it is gratifying to know, are being more and more recognized and valued through the growing enlightenment on the part of the general public. Indeed, the subjugation or extinction of infective spreading diseases depends so greatly on the degree of general intelligence found in a people or population, and in their quickening perception of conditions contraband of public health, that there is ground for the belief, in view of what has already been accomplished, that epidemics, as now known and feared, will some day be looked upon as lingering reminders of a negligent and blameworthy age; and that the ills, now so dreaded yet often invited, will be overcome altogether, and, perhaps, finally survive only in the annals or medical traditions of the human race.





